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PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
 United States Patent and Trademark
 Office
 Box PCT
 Washington, D.C.20231
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 13 June 2000 (13.06.00)	
International application No. PCT/GB99/03574	Applicant's or agent's file reference CDK1611
International filing date (day/month/year) 28 October 1999 (28.10.99)	Priority date (day/month/year) 06 November 1998 (06.11.98)
Applicant HASLING, Peter, David	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
 15 May 2000 (15.05.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Juan Cruz Telephone No.: (41-22) 338.83.38
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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB99/03574

I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).)*:

Description, pages:

1-13 as originally filed

Claims, No.:

1-31 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB99/03574

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	
	No:	Claims	1-31
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-31
Industrial applicability (IA)	Yes:	Claims	1-31
	No:	Claims	

2. Citations and explanations **see separate sheet**

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB99/03574

ad section V.:

The most relevant prior art cited in the international search report is considered to be represented by the following documents

D1 FR-A-2 325 662

D2 EP-A-458 245.

D2 discloses at page 3, lines 3 - 20 and in claims 1 - 3 an unsaturated phosphate monomer of formula $\text{CH}_2=\text{C}(\text{X})-\text{CO}-(\text{OY})_n-\text{OPO}(\text{OH})_2$ wherein X may be hydrogen or methyl, Y is an alkylene group having 2 - 4 carbon atoms and n is an integer of 3 to 30. In particular, claim 3 mentions compounds wherein Y = propylene or ethylene and n=6 or 12. These compounds are preferably prepared by reacting a (meth)acrylic acid with an alkylene oxide to form a polyalkyleneglycol monoester (preferably in the presence of a catalyst) which is then reacted with orthophosphoric acid (page 3, lines 2 - 15). From the worked examples it is clear that these compounds are also commercially available (eg Phosmer PP, Phosmer 12PP from Uni Chemical Co.).

The unsaturated phosphate compounds mentioned above are used in D2 in aqueous coating compositions comprising in addition an acrylic resin and a pigment (see claim 1).

The subject matter of claims 1 - 31 of the present application is therefore not novel over the disclosure of D2 (Article 33(2) PCT).

In addition, it is known from D1 (page 2, lines 7 - 12, page 3, line 9 to page 4, lines 35) to use these unsaturated phosphate compounds as polymerisable emulsifiers in compositions especially suitable for coatings. Therefore, the subject matter of claims 1 - 31 does not appear to be based on an inventive step taking into account the teachings of D1 and D2 (Article 33(3) PCT).

ad section VIII.:

Claims 29 - 31 contain a reference to the description. According to Rule 6.2(a) PCT,

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB99/03574

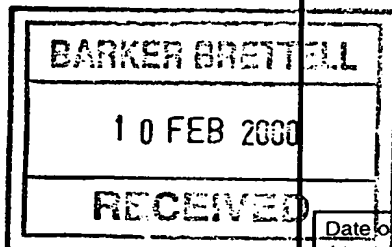
claims should not contain such references except where absolutely necessary, which is not the case here.

PATENT COOPERATION TREATY



From the INTERNATIONAL SEARCHING AUTHORITY

To:
Barker Brettell
138 Hagley Road
Edgbaston
Birmingham B16 9PW
UNITED KINGDOM



NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT
OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing
(day/month/year)

04/02/2000

Applicant's or agent's file reference

CDK1611

FOR FURTHER ACTION

See paragraphs 1 and 4 below

International application No.

PCT/GB 99/03574

International filing date

(day/month/year)

28/10/1999

Applicant

ALBRIGHT & WILSON UK LIMITED et al.

1. ☒ The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Fascimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

Within 19 months from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within 20 months from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority



European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl.
Fax: (+31-70) 340-3016

Authorized officer

Philip Van Kalsbeek

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

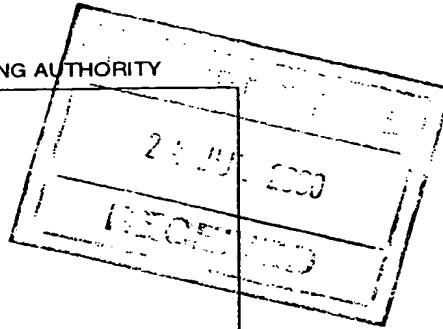
For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

PATENT COOPERATION TREATY

From the:
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

Barker Brettell
138 Hagley Road
Edgbaston
Birmingham B16 9PW
GRANDE BRETAGNE

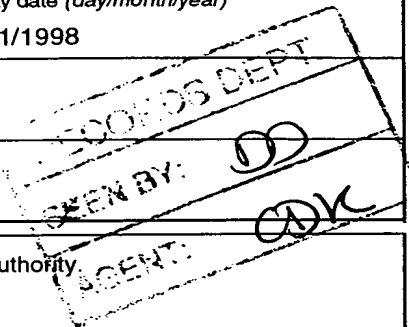


PCT

WRITTEN OPINION

(PCT Rule 66)

Date of mailing (day/month/year)		20.07.2000
Applicant's or agent's file reference CDK1611		REPLY DUE within 3 month(s) from the above date of mailing
International application No. PCT/GB99/03574	International filing date (day/month/year) 28/10/1999	Priority date (day/month/year) 06/11/1998
International Patent Classification (IPC) or both national classification and IPC C08F2/26		
Applicant ALBRIGHT & WILSON UK LIMITED et al.		





- This written opinion is the first drawn up by this International Preliminary Examining Authority.
- This opinion contains indications relating to the following items:
 - ☒ Basis of the opinion
 - ☐ Priority
 - ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - ☐ Lack of unity of invention
 - ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - ☐ Certain document cited
 - ☐ Certain defects in the international application
 - ☒ Certain observations on the international application
- The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.
- The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 06/03/2001.

Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer / Examiner Knutzen-Mies, K	
	Formalities officer (incl. extension of time limits) Mastropietro, M Telephone No. +49 89 2399 8092	

I. Basis of the opinion

1. This opinion has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed".*):

Description, pages:

1-13 as originally filed

Claims, No.:

1-31 as originally filed

2. The amendments have resulted in the cancellation of:

☐ the description, pages:

☐ the claims, Nos.:

☐ the drawings, sheets:

3. This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N) Claims 1-31

Inventive step (IS) Claims 1-31

Industrial applicability (IA) Claims

2. Citations and explanations

see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

ad section V.:

The most relevant prior art cited in the international search report is considered to be represented by the following documents

D1 FR-A-2 325 662

D2 EP-A-458 245.

D2 discloses at page 3, lines 3 - 20 and in claims 1 - 3 an unsaturated phosphate monomer of formula $\text{CH}_2=\text{C}(\text{X})-\text{CO}-(\text{OY})_n-\text{OPO}(\text{OH})_2$ wherein X may be hydrogen or methyl, Y is an alkylene group having 2 - 4 carbon atoms and n is an integer of 3 to 30. In particular, claim 3 mentions compounds wherein Y = propylene or ethylene and n=6 or 12. These compounds are preferably prepared by reacting a (meth)acrylic acid with an alkylene oxide to form a polyalkyleneglycol monoester (preferably in the presence of a catalyst) which is then reacted with orthophosphoric acid (page 3, lines 2 - 15). From the worked examples it is clear that these compounds are also commercially available (eg Phosmer PP, Phosmer 12PP from Uni Chemical Co.).

The unsaturated phosphate compounds mentioned above are used in D2 in aqueous coating compositions comprising in addition an acrylic resin and a pigment (see claim 1).

The subject matter of claims 1 - 31 of the present application is therefore not novel over the disclosure of D2 (Article 33(2) PCT).

In addition, it is known from D1 (page 2, lines 7 - 12, page 3, line 9 to page 4, lines 35) to use these unsaturated phosphate compounds as polymerisable emulsifiers in compositions especially suitable for coatings. Therefore, the subject matter of claims 1 - 31 does not appear to be based on an inventive step taking into account the teachings of D1 and D2 (Article 33(3) PCT).

ad section VIII.:

Claims 29 - 31 contain a reference to the description. According to Rule 6.2(a) PCT,

**WRITTEN OPINION
SEPARATE SHEET**

International application No. PCT/GB99/03574

claims should not contain such references except where absolutely necessary, which is not the case here.

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference
(if desired) (12 characters maximum) CDK1611

Box No. I TITLE OF THE INVENTION
POLYMERISABLE SURFACTANTS

Box No. II APPLICANT

Name and address: (Family name followed by given name; for legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.)

ALBRIGHT & WILSON UK LIMITED
210-222 HAGLEY ROAD WEST
WARLEY
WEST MIDLANDS
GB - B68 0NN

☐ This person is also inventor

Telephone No.
+ 44 121 420 5432

Facsimile No.
+ 44 121 420 5437

Teleprinter No.
-

State (i.e. country) of nationality:
GB

State (i.e. country) of residence:
GB

This person is applicant for the purposes of: ☐ all designated States ☒ all designated States except the United States of America ☐ The United States of America only ☐ the States indicated in the Supplemental Box

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER INVENTOR(S))

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country)

HASLING, PETER DAVID
29 CLIFTON STREET
STOURBRIDGE
WEST MIDLANDS
GB - DY8 3XR

This person is:

☐ applicant only

☒ applicant and inventor

☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality
GB

State (i.e. country) of residence
GB

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ The United States of America only ☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on a continuation sheet.

Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: ☒ agent ☐ common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country).

Barker Brettell

138 Hagley Road
Edgbaston
Birmingham B16 9PW
England

Telephone No.
0121 456 1364

Facsimile No.
0121 456 1368

Teleprinter No.
337898

☐ mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Box No. V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

Regional Patent

- ☒ AP ARIPO Patent: GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SL Sierra Leone, SZ Swaziland, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ EA Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ EP European Patent: AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ OA OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

National Patent (if other kind of protection or treatment desired, specify on dotted line):

- | | |
|--|--|
| <input checked="" type="checkbox"/> AE United Arab Emirates | <input checked="" type="checkbox"/> LR Liberia |
| <input checked="" type="checkbox"/> AL Albania | <input checked="" type="checkbox"/> LS Lesotho |
| <input checked="" type="checkbox"/> AM Armenia | <input checked="" type="checkbox"/> LT Lithuania |
| <input checked="" type="checkbox"/> AT Austria | <input checked="" type="checkbox"/> LU Luxembourg |
| <input checked="" type="checkbox"/> AU Australia | <input checked="" type="checkbox"/> LV Latvia |
| <input checked="" type="checkbox"/> AZ Azerbaijan | <input checked="" type="checkbox"/> MD Republic of Moldova |
| <input checked="" type="checkbox"/> BA Bosnia and Herzegovina | <input checked="" type="checkbox"/> MG Madagascar |
| <input checked="" type="checkbox"/> BB Barbados | <input checked="" type="checkbox"/> MK The former Yugoslav Republic of Macedonia |
| <input checked="" type="checkbox"/> BG Bulgaria | |
| <input checked="" type="checkbox"/> BR Brazil | <input checked="" type="checkbox"/> MN Mongolia |
| <input checked="" type="checkbox"/> BY Belarus | <input checked="" type="checkbox"/> MW Malawi |
| <input checked="" type="checkbox"/> CA Canada | <input checked="" type="checkbox"/> MX Mexico |
| <input checked="" type="checkbox"/> CH and LI Switzerland and Liechtenstein | <input checked="" type="checkbox"/> NO Norway |
| <input checked="" type="checkbox"/> CN China | <input checked="" type="checkbox"/> NZ New Zealand |
| <input checked="" type="checkbox"/> CU Cuba | <input checked="" type="checkbox"/> PL Poland |
| <input checked="" type="checkbox"/> CZ Czech Republic | <input checked="" type="checkbox"/> PT Portugal |
| <input checked="" type="checkbox"/> DE Germany | <input checked="" type="checkbox"/> RO Romania |
| <input checked="" type="checkbox"/> DK Denmark | <input checked="" type="checkbox"/> RU Russian Federation |
| <input checked="" type="checkbox"/> EE Estonia | <input checked="" type="checkbox"/> SD Sudan |
| <input checked="" type="checkbox"/> ES Spain | <input checked="" type="checkbox"/> SE Sweden |
| <input checked="" type="checkbox"/> FI Finland | <input checked="" type="checkbox"/> SG Singapore |
| <input checked="" type="checkbox"/> GB United Kingdom | <input checked="" type="checkbox"/> SI Slovenia |
| <input checked="" type="checkbox"/> GD Grenada | <input checked="" type="checkbox"/> SK Slovakia |
| <input checked="" type="checkbox"/> GE Georgia | <input checked="" type="checkbox"/> SL Sierra Leone |
| <input checked="" type="checkbox"/> GH Ghana | <input checked="" type="checkbox"/> TJ Tajikistan |
| <input checked="" type="checkbox"/> GM Gambia | <input checked="" type="checkbox"/> TM Turkmenistan |
| <input checked="" type="checkbox"/> HR Croatia | <input checked="" type="checkbox"/> TR Turkey |
| <input checked="" type="checkbox"/> HU Hungary | <input checked="" type="checkbox"/> TT Trinidad and Tobago |
| <input checked="" type="checkbox"/> ID Indonesia | <input checked="" type="checkbox"/> UA Ukraine |
| <input checked="" type="checkbox"/> IL Israel | <input checked="" type="checkbox"/> UG Uganda |
| <input checked="" type="checkbox"/> IN India | <input checked="" type="checkbox"/> US United States of America |
| <input checked="" type="checkbox"/> IS Iceland | |
| <input checked="" type="checkbox"/> JP Japan | <input checked="" type="checkbox"/> UZ Uzbekistan |
| <input checked="" type="checkbox"/> KE Kenya | <input checked="" type="checkbox"/> VN Viet Nam |
| <input checked="" type="checkbox"/> KG Kyrgyzstan | <input checked="" type="checkbox"/> YU Yugoslavia |
| <input checked="" type="checkbox"/> KP Democratic People's Republic of Korea | <input checked="" type="checkbox"/> ZA South Africa |
| | <input checked="" type="checkbox"/> ZW Zimbabwe |
| <input checked="" type="checkbox"/> KR Republic of Korea | Check-boxes reserved for designating States which have become party to the PCT after issuance of this sheet: |
| <input checked="" type="checkbox"/> KZ Kazakhstan | <input checked="" type="checkbox"/> COSTA RICA |
| <input checked="" type="checkbox"/> LC Saint Lucia | <input checked="" type="checkbox"/> TANZANIA |
| <input checked="" type="checkbox"/> LK Sri Lanka | |

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)

Supplemental Box

If the Supplemental Box is not used, this sheet should not be included in the request.

1. If, in any of the Boxes, the space is insufficient to furnish all the information: in such case, write "Continuation of Box No. ..." [indicate the number of the Box] and furnish the information in the same manner as required according to the captions of the Box in which the space was insufficient, in particular:
 - (i) if more than two persons are involved as applicants and/or inventors and no "continuation sheet" is available: in such case, write "Continuation of Box No. III" and indicate for each additional person the same type of information as required in Box No. III. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below;
 - (ii) if, in Box No. II or in any of the sub-boxes of Box No. III, the indication "the States indicated in the Supplemental Box" is checked: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the applicant(s) involved and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian, European or OAPI patent) for the purposes of which the named person is applicant;
 - (iii) if, in Box No. II or in any of the sub-boxes of Box No. III, the inventor or the inventor/applicant is not inventor for the purposes of all designated States or for the purposes of the United States of America: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the inventor(s) and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian, European or OAPI patent) for the purposes of which the named person is inventor;
 - (iv) if, in addition to the agent(s) indicated in Box No. IV, there are further agents: in such case, write "Continuation of Box No. IV" and indicate for each further agent the same type of information as required in Box No. IV;
 - (v) if, in Box No. V, the name of any State (or OAPI) is accompanied by the indication "patent of addition," or "certificate of addition," or if, in Box No. V, the name of the United States of America is accompanied by an indication "continuation" or "continuation-in-part": in such case, write "Continuation of Box No. V" and the name of each State involved (or OAPI), and after the name of each such State (or OAPI), the number of the parent title or parent application and the date of grant of the parent title or filing of the parent application;
 - (vi) if, in Box No. VI, there are more than three earlier applications whose priority is claimed: in such case, write "Continuation of Box No. VI" and indicate for each additional earlier application the same type of information as required in Box No. VI;
 - (vii) if, in Box No. VI, the earlier application is an ARIPO application: in such case, write "Continuation of Box No. VI", specify the number of the item corresponding to that earlier application and indicate at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed.
2. If, with regard to the precautionary designation statement contained in Box No. V, the applicant wishes to exclude any State(s) from the scope of that statement: in such case, write "Designation(s) excluded from precautionary designation statement" and indicate the name or two-letter code of each State so excluded.
3. If the applicant claims, in respect of any designated Office, the benefits of provisions of the national law concerning non-prejudicial disclosures or exceptions to lack of novelty: in such case, write "Statement concerning non-prejudicial disclosures or exceptions to lack of novelty" and furnish that statement below.

Continuation of Box No. V
Designation of States:

X MOROCCO
X DOMINICA

Box No. VI PRIORITY CLAIM		<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application: regional Office	international application: receiving Office
item (1) 6 November 1998	9824267.0	GB		
item (2) 5 June 1999	9913034.6	GB		
item (3)				
<input type="checkbox"/> The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s):				
<i>* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.</i>				
Box No. VII INTERNATIONAL SEARCHING AUTHORITY				
Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):		Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):		
ISA / EP		Date (day/month/year)	Number	Country (or regional Office)
Box No. VIII CHECK LIST; LANGUAGE OF FILING				
This international application contains the following number of sheets: request : 4 description (excluding sequence listing part) : 13 claims : 5 abstract : 1 drawings : NIL sequence listing part of description : NIL Total number of sheets : 23		This international application is accompanied by the item(s) marked below: 1. <input type="checkbox"/> fee calculation sheet 2. <input checked="" type="checkbox"/> separate signed power of attorney 3. <input checked="" type="checkbox"/> copy of general power of attorney; reference number, if any: 4. <input type="checkbox"/> statement explaining lack of signature 5. <input checked="" type="checkbox"/> priority document(s) identified in Box No. VI as item(s): (1), (2). 6. <input type="checkbox"/> translation of international application into (language): 7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material 8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form 9. <input type="checkbox"/> other (specify):		
Figure of the drawings which should accompany the abstract: N/A		Language of filing of the international application: ENGLISH		
Box No. IX SIGNATURE OF APPLICANT OR AGENT				
Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).				
Barker Brettell				

For receiving Office use only		2. Drawings: <input type="checkbox"/> received: <input type="checkbox"/> not received:
1. Date of actual receipt of the purported international application:		
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority (if two or more are competent): ISA /		6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.

For International Bureau use only	
Date of receipt of the record copy by the International Bureau:	

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference CDK1611	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/GB 99/ 03574	International filing date (day/month/year) 28/10/1999	(Earliest) Priority Date (day/month/year) 06/11/1998
Applicant ALBRIGHT & WILSON UK LIMITED et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 2 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

/GB 99/03574

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C08F2/26 C09D157/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C08F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 325 662 A (SYNRES INT. B.V.) 22 April 1977 (1977-04-22) page 3, line 32 -page 4, line 27; claim 1 page 1, line 5 -page 1, line 12 ----	1-31
A	US 3 855 364 A (R. STECKLER) 17 December 1974 (1974-12-17) ----	
A	EP 0 458 245 A (NIPPON PAINT CO.) 27 November 1991 (1991-11-27) -----	



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

25 January 2000

Date of mailing of the international search report

04/02/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Cauwenberg, C

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

GB 99/03574

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 2325662	A	22-04-1977	NL 7511275 A	29-03-1977
			BE 846560 A	17-01-1977
			DE 2643144 A	07-04-1977
			GB 1553722 A	26-09-1979
			US 4101490 A	18-07-1978

US 3855364	A	17-12-1974	NONE	

EP 458245	A	27-11-1991	JP 2114275 C	06-12-1996
			JP 4025578 A	29-01-1992
			JP 8022991 B	06-03-1996
			AU 634061 B	11-02-1993
			AU 7721791 A	21-11-1991
			CA 2042935 A	22-11-1991
			DE 69105818 D	26-01-1995
			DE 69105818 T	18-05-1995
			US 5151125 A	29-09-1992

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference CDK1611	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/GB 99/ 03574	International filing date (day/month/year) 28/10/1999	(Earliest) Priority Date (day/month/year) 06/11/1998
Applicant ALBRIGHT & WILSON UK LIMITED et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 2 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (see Box II).

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

T/GB 99/03574

CLASSIFICATION OF SUBJECT MATTER

IPC 7 C08F2/26 C09D157/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C08F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 325 662 A (SYNRES INT. B.V.) 22 April 1977 (1977-04-22) page 3, line 32 -page 4, line 27; claim 1 page 1, line 5 -page 1, line 12 ---	1-31
A	US 3 855 364 A (R. STECKLER) 17 December 1974 (1974-12-17) ---	
A	EP 0 458 245 A (NIPPON PAINT CO.) 27 November 1991 (1991-11-27) -----	

☐ Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

25 January 2000

Date of mailing of the international search report

04/02/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Cauwenberg, C

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 99/03574

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 2325662 A	22-04-1977	NL 7511275 A BE 846560 A DE 2643144 A GB 1553722 A US 4101490 A	29-03-1977 17-01-1977 07-04-1977 26-09-1979 18-07-1978
US 3855364 A	17-12-1974	NONE	
EP 458245 A	27-11-1991	JP 2114275 C JP 4025578 A JP 8022991 B AU 634061 B AU 7721791 A CA 2042935 A DE 69105818 D DE 69105818 T US 5151125 A	06-12-1996 29-01-1992 06-03-1996 11-02-1993 21-11-1991 22-11-1991 26-01-1995 18-05-1995 29-09-1992

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

BARKER BRETTELL
138 Hagley Road
Edgbaston
BIRMINGHAM, B16 9PW
GRANDE BRETAGNE

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Rule 71.1)

Date of mailing (day/month/year)	10.11.2000
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Applicant's or agent's file reference CDK1611	IMPORTANT NOTIFICATION
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International application No. PCT/GB99/03574	International filing date (day/month/year) 28/10/1999	Priority date (day/month/year) 06/11/1998
---	--	--

Applicant ALBRIGHT & WILSON UK LIMITED et al.
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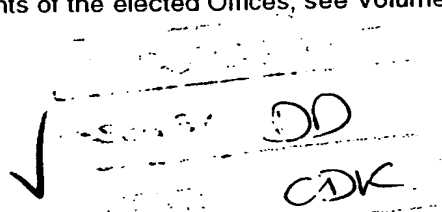
1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.


 DD
 CDK

Name and mailing address of the IPEA/	Authorized officer
---------------------------------------	--------------------

 European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Mastropietro, M Tel. +49 89 2399-8092
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PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference CDK1611	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB99/03574	International filing date (day/month/year) 28/10/1999	Priority date (day/month/year) 06/11/1998
International Patent Classification (IPC) or national classification and IPC C08F2/26		
Applicant ALBRIGHT & WILSON UK LIMITED et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.


2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 15/05/2000	Date of completion of this report 10.11.2000
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Knutzen-Mies. K Telephone No. +49 89 2399 8525



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB99/03574

I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).):*

Description, pages:

1-13 as originally filed

Claims, No.:

1-31 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB99/03574

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	
	No:	Claims	1-31
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-31
Industrial applicability (IA)	Yes:	Claims	1-31
	No:	Claims	

2. Citations and explanations
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB99/03574

ad section V.:

The most relevant prior art cited in the international search report is considered to be represented by the following documents

D1 FR-A-2 325 662

D2 EP-A-458 245.

D2 discloses at page 3, lines 3 - 20 and in claims 1 - 3 an unsaturated phosphate monomer of formula $\text{CH}_2=\text{C}(\text{X})-\text{CO}-(\text{OY})_n-\text{OPO}(\text{OH})_2$ wherein X may be hydrogen or methyl, Y is an alkylene group having 2 - 4 carbon atoms and n is an integer of 3 to 30. In particular, claim 3 mentions compounds wherein Y = propylene or ethylene and n=6 or 12. These compounds are preferably prepared by reacting a (meth)acrylic acid with an alkylene oxide to form a polyalkyleneglycol monoester (preferably in the presence of a catalyst) which is then reacted with orthophosphoric acid (page 3, lines 2 - 15). From the worked examples it is clear that these compounds are also commercially available (eg Phosmer PP, Phosmer 12PP from Uni Chemical Co.).

The unsaturated phosphate compounds mentioned above are used in D2 in aqueous coating compositions comprising in addition an acrylic resin and a pigment (see claim 1).

The subject matter of claims 1 - 31 of the present application is therefore not novel over the disclosure of D2 (Article 33(2) PCT).

In addition, it is known from D1 (page 2, lines 7 - 12, page 3, line 9 to page 4, lines 35) to use these unsaturated phosphate compounds as polymerisable emulsifiers in compositions especially suitable for coatings. Therefore, the subject matter of claims 1 - 31 does not appear to be based on an inventive step taking into account the teachings of D1 and D2 (Article 33(3) PCT).

ad section VIII.:

Claims 29 - 31 contain a reference to the description. According to Rule 6.2(a) PCT,

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB99/03574

claims should not contain such references except where absolutely necessary, which is not the case here.

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference
(if desired)(12 characters maximum) CDK1611

Box No. I TITLE OF THE INVENTION
POLYMERISABLE SURFACTANTS

Box No. II APPLICANT

Name and address: (Family name followed by given name; for legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.)

ALBRIGHT & WILSON UK LIMITED
210-222 HAGLEY ROAD WEST
WARLEY
WEST MIDLANDS
GB - B68 0NN

☐ This person is also inventor

Telephone No.
+ 44 121 420 5432

Facsimile No.
+ 44 121 420 5437

Teleprinter No.
-

State (i.e. country) of nationality:
GB

State (i.e. country) of residence:
GB

This person is applicant for the purposes of: ☐ all designated States ☒ all designated States except the United States of America ☐ The United States of America only ☐ the States indicated in the Supplemental Box

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER INVENTOR(S))

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country)

HASLING, PETER DAVID
29 CLIFTON STREET
STOURBRIDGE
WEST MIDLANDS
GB - DY8 3XR

This person is:

☐ applicant only

☒ applicant and inventor

☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality
GB

State (i.e. country) of residence
GB

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ The United States of America only ☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on a continuation sheet.

Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: ☒ agent ☐ common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country).

Barker Brettell

138 Hagley Road
Edgbaston
Birmingham B16 9PW
England

Telephone No.
0121 456 1364

Facsimile No.
0121 456 1368

Teleprinter No.
337898

☐ mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Box No. V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

Regional Patent

- ☒ AP ARIPO Patent: GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SL Sierra Leone, SZ Swaziland, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ EA Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ EP European Patent: AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ OA OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

National Patent (if other kind of protection or treatment desired, specify on dotted line):

- | | |
|--|--|
| <input checked="" type="checkbox"/> AE United Arab Emirates | <input checked="" type="checkbox"/> LR Liberia |
| <input checked="" type="checkbox"/> AL Albania | <input checked="" type="checkbox"/> LS Lesotho |
| <input checked="" type="checkbox"/> AM Armenia | <input checked="" type="checkbox"/> LT Lithuania |
| <input checked="" type="checkbox"/> AT Austria | <input checked="" type="checkbox"/> LU Luxembourg |
| <input checked="" type="checkbox"/> AU Australia | <input checked="" type="checkbox"/> LV Latvia |
| <input checked="" type="checkbox"/> AZ Azerbaijan | <input checked="" type="checkbox"/> MD Republic of Moldova |
| <input checked="" type="checkbox"/> BA Bosnia and Herzegovina | <input checked="" type="checkbox"/> MG Madagascar |
| <input checked="" type="checkbox"/> BB Barbados | <input checked="" type="checkbox"/> MK The former Yugoslav Republic of Macedonia |
| <input checked="" type="checkbox"/> BG Bulgaria | |
| <input checked="" type="checkbox"/> BR Brazil | <input checked="" type="checkbox"/> MN Mongolia |
| <input checked="" type="checkbox"/> BY Belarus | <input checked="" type="checkbox"/> MW Malawi |
| <input checked="" type="checkbox"/> CA Canada | <input checked="" type="checkbox"/> MX Mexico |
| <input checked="" type="checkbox"/> CH and LI Switzerland and Liechtenstein | <input checked="" type="checkbox"/> NO Norway |
| <input checked="" type="checkbox"/> CN China | <input checked="" type="checkbox"/> NZ New Zealand |
| <input checked="" type="checkbox"/> CU Cuba | <input checked="" type="checkbox"/> PL Poland |
| <input checked="" type="checkbox"/> CZ Czech Republic | <input checked="" type="checkbox"/> PT Portugal |
| <input checked="" type="checkbox"/> DE Germany | <input checked="" type="checkbox"/> RO Romania |
| <input checked="" type="checkbox"/> DK Denmark | <input checked="" type="checkbox"/> RU Russian Federation |
| <input checked="" type="checkbox"/> EE Estonia | <input checked="" type="checkbox"/> SD Sudan |
| <input checked="" type="checkbox"/> ES Spain | <input checked="" type="checkbox"/> SE Sweden |
| <input checked="" type="checkbox"/> FI Finland | <input checked="" type="checkbox"/> SG Singapore |
| <input checked="" type="checkbox"/> GB United Kingdom | <input checked="" type="checkbox"/> SI Slovenia |
| <input checked="" type="checkbox"/> GD Grenada | <input checked="" type="checkbox"/> SK Slovakia |
| <input checked="" type="checkbox"/> GE Georgia | <input checked="" type="checkbox"/> SL Sierra Leone |
| <input checked="" type="checkbox"/> GH Ghana | <input checked="" type="checkbox"/> TJ Tajikistan |
| <input checked="" type="checkbox"/> GM Gambia | <input checked="" type="checkbox"/> TM Turkmenistan |
| <input checked="" type="checkbox"/> HR Croatia | <input checked="" type="checkbox"/> TR Turkey |
| <input checked="" type="checkbox"/> HU Hungary | <input checked="" type="checkbox"/> TT Trinidad and Tobago |
| <input checked="" type="checkbox"/> ID Indonesia | <input checked="" type="checkbox"/> UA Ukraine |
| <input checked="" type="checkbox"/> IL Israel | <input checked="" type="checkbox"/> UG Uganda |
| <input checked="" type="checkbox"/> IN India | <input checked="" type="checkbox"/> US United States of America |
| <input checked="" type="checkbox"/> IS Iceland | |
| <input checked="" type="checkbox"/> JP Japan | <input checked="" type="checkbox"/> UZ Uzbekistan |
| <input checked="" type="checkbox"/> KE Kenya | <input checked="" type="checkbox"/> VN Viet Nam |
| <input checked="" type="checkbox"/> KG Kyrgyzstan | <input checked="" type="checkbox"/> YU Yugoslavia |
| <input checked="" type="checkbox"/> KP Democratic People's Republic of Korea | <input checked="" type="checkbox"/> ZA South Africa |
| | <input checked="" type="checkbox"/> ZW Zimbabwe |
| <input checked="" type="checkbox"/> KR Republic of Korea | Check-boxes reserved for designating States which have become party to the PCT after issuance of this sheet: |
| <input checked="" type="checkbox"/> KZ Kazakhstan | <input checked="" type="checkbox"/> COSTA RICA |
| <input checked="" type="checkbox"/> LC Saint Lucia | <input checked="" type="checkbox"/> TANZANIA |
| <input checked="" type="checkbox"/> LK Sri Lanka | |

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)

Supplemental Box *If the Supplemental Box is not used, this sheet should not be included in the request.*

1. If, in any of the Boxes, the space is insufficient to furnish all the information: in such case, write "Continuation of Box No. ..." [indicate the number of the Box] and furnish the information in the same manner as required according to the captions of the Box in which the space was insufficient, in particular:

- (i) if more than two persons are involved as applicants and/or inventors and no "continuation sheet" is available: in such case, write "Continuation of Box No. III" and indicate for each additional person the same type of information as required in Box No. III. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below;
- (ii) if, in Box No. II or in any of the sub-boxes of Box No. III, the indication "the States indicated in the Supplemental Box" is checked: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the applicant(s) involved and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian, European or OAPI patent) for the purposes of which the named person is applicant;
- (iii) if, in Box No. II or in any of the sub-boxes of Box No. III, the inventor or the inventor/applicant is not inventor for the purposes of all designated States or for the purposes of the United States of America: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the inventor(s) and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian, European or OAPI patent) for the purposes of which the named person is inventor;
- (iv) if, in addition to the agent(s) indicated in Box No. IV, there are further agents: in such case, write "Continuation of Box No. IV" and indicate for each further agent the same type of information as required in Box No. IV;
- (v) if, in Box No. V, the name of any State (or OAPI) is accompanied by the indication "patent of addition," or "certificate of addition," or if, in Box No. V, the name of the United States of America is accompanied by an indication "continuation" or "continuation-in-part": in such case, write "Continuation of Box No. V" and the name of each State involved (or OAPI), and after the name of each such State (or OAPI), the number of the parent title or parent application and the date of grant of the parent title or filing of the parent application;
- (vi) if, in Box No. VI, there are more than three earlier applications whose priority is claimed: in such case, write "Continuation of Box No. VI" and indicate for each additional earlier application the same type of information as required in Box No. VI;
- (vii) if, in Box No. VI, the earlier application is an ARIPO application: in such case, write "Continuation of Box No. VI", specify the number of the item corresponding to that earlier application and indicate at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed.

2. If, with regard to the precautionary designation statement contained in Box No. V, the applicant wishes to exclude any State(s) from the scope of that statement: in such case, write "Designation(s) excluded from precautionary designation statement" and indicate the name or two-letter code of each State so excluded.

3. If the applicant claims, in respect of any designated Office, the benefits of provisions of the national law concerning non-prejudicial disclosures or exceptions to lack of novelty: in such case, write "Statement concerning non-prejudicial disclosures or exceptions to lack of novelty" and furnish that statement below.

Continuation of Box No. V
Designation of States:

X MOROCCO
X DOMINICA

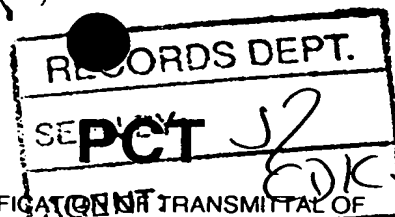
Box No. VI PRIORITY CLAIM		<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application: regional Office	international application: receiving Office
item (1) 6 November 1998	9824267.0	GB		
item (2) 5 June 1999	9913034.6	GB		
item (3)				
<input type="checkbox"/> The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s):				
<i>* Where the earlier application is anARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.</i>				
Box No. VII INTERNATIONAL SEARCHING AUTHORITY				
Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):		Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority): Date (day/month/year) Number Country (or regional Office)		
ISA / EP				
Box No. VIII CHECK LIST; LANGUAGE OF FILING				
This international application contains the following number of sheets: request : 4 description (excluding sequence listing part) : 13 claims : 5 abstract : 1 drawings : NIL sequence listing part of description : NIL Total number of sheets : 23		This international application is accompanied by the item(s) marked below: 1. <input type="checkbox"/> fee calculation sheet 2. <input checked="" type="checkbox"/> separate signed power of attorney 3. <input checked="" type="checkbox"/> copy of general power of attorney; reference number, if any: 4. <input type="checkbox"/> statement explaining lack of signature 5. <input checked="" type="checkbox"/> priority document(s) identified in Box No. VI as item(s): (1), (2). 6. <input type="checkbox"/> translation of international application into (language): 7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material 8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form 9. <input type="checkbox"/> other (specify):		
Figure of the drawings which should accompany the abstract: N/A		Language of filing of the international application: ENGLISH		
Box No. IX SIGNATURE OF APPLICANT OR AGENT				
Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).				
Barker Brettell				

For receiving Office use only		2. Drawings: <input type="checkbox"/> received: <input type="checkbox"/> not received:
1. Date of actual receipt of the purported international application:		
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority (if two or more are competent): ISA /		6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.

For International Bureau use only	
Date of receipt of the record copy by the International Bureau:	

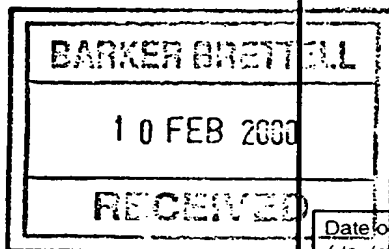
Form PCT/RO/101 (last sheet) (July 1998; reprint July 1999) See Notes to the request form

PATENT COOPERATION TREATY



From the INTERNATIONAL SEARCHING AUTHORITY

To:
Barker Brettell
138 Hagley Road
Edgbaston
Birmingham B16 9PW
UNITED KINGDOM



NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT
OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing
(day/month/year) 04/02/2000

Applicant's or agent's file reference

CDK1611

FOR FURTHER ACTION

See paragraphs 1 and 4 below

International application No.

PCT/GB 99/03574

International filing date

(day/month/year)

28/10/1999

Applicant

ALBRIGHT & WILSON UK LIMITED et al.

1. ☒ The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

Within 19 months from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within 20 months from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority



European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Philip Van Kalsbeek

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference CDK1611	FOR FURTHER ACTION		see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. PCT/GB 99/ 03574	International filing date (day/month/year) 28/10/1999	(Earliest) Priority Date (day/month/year) 06/11/1998	
Applicant ALBRIGHT & WILSON UK LIMITED et al.			

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 2 sheets.
☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :
- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the title,

- ☒ the text is approved as submitted by the applicant.
- ☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

- ☒ the text is approved as submitted by the applicant.
- ☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

- ☐ as suggested by the applicant.
- ☐ because the applicant failed to suggest a figure.
- ☐ because this figure better characterizes the invention.
- ☐ None of the figures.

INTERNATIONAL SEARCH REPORT

National Application No

PCT/ 99/03574

CLASSIFICATION OF SUBJECT MATTER

IPC 7 C08F2/26 C09D157/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C08F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 325 662 A (SYNRES INT. B.V.) 22 April 1977 (1977-04-22) page 3, line 32 -page 4, line 27; claim 1 page 1, line 5 -page 1, line 12 ----	1-31
A	US 3 855 364 A (R. STECKLER) 17 December 1974 (1974-12-17) ----	
A	EP 0 458 245 A (NIPPON PAINT CO.) 27 November 1991 (1991-11-27) -----	

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

*** Special categories of cited documents :**

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

25 January 2000

Date of mailing of the international search report

04/02/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
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Cauwenberg, C

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/JP 99/03574

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
FR 2325662	A	22-04-1977	NL	7511275 A	29-03-1977
			BE	846560 A	17-01-1977
			DE	2643144 A	07-04-1977
			GB	1553722 A	26-09-1979
			US	4101490 A	18-07-1978

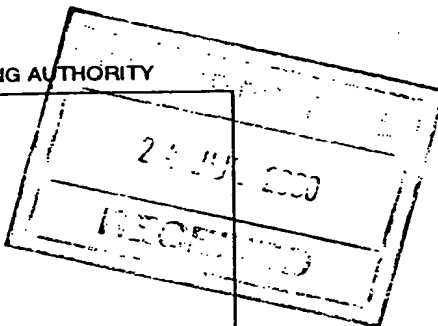
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			DE	69105818 D	26-01-1995
			DE	69105818 T	18-05-1995
US	5151125 A	29-09-1992			

PATENT COOPERATION TREATY

From the:
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:
Barker Brettell
138 Hagley Road
Edgbaston
Birmingham B16 9PW
GRANDE BRETAGNE

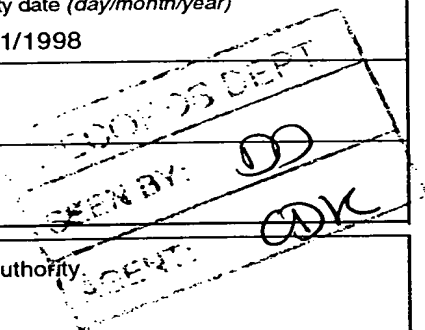


PCT

WRITTEN OPINION

(PCT Rule 66)

Date of mailing (day/month/year)		20.07.2000
Applicant's or agent's file reference CDK1611		REPLY DUE within 3 month(s) from the above date of mailing
International application No. PCT/GB99/03574	International filing date (day/month/year) 28/10/1999	Priority date (day/month/year) 06/11/1998
International Patent Classification (IPC) or both national classification and IPC C08F2/26		
Applicant ALBRIGHT & WILSON UK LIMITED et al.		




- This written opinion is the first drawn up by this International Preliminary Examining Authority.
- This opinion contains indications relating to the following items:
 - ☒ Basis of the opinion
 - ☐ Priority
 - ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - ☐ Lack of unity of invention
 - ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - ☐ Certain document cited
 - ☐ Certain defects in the international application
 - ☒ Certain observations on the international application
- The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.
- The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 06/03/2001.

Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer / Examiner Knutzen-Mies, K
	Formalities officer (incl. extension of time limits) Mastropietro, M Telephone No. +49 89 2399 8092



I. Basis of the opinion

1. This opinion has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed".*):

Description, pages:

1-13 as originally filed

Claims, No.:

1-31 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

3. This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	1-31
Inventive step (IS)	Claims	1-31
Industrial applicability (IA)	Claims	

2. Citations and explanations

see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

ad section V.:

The most relevant prior art cited in the international search report is considered to be represented by the following documents

D1 FR-A-2 325 662

D2 EP-A-458 245.

D2 discloses at page 3, lines 3 - 20 and in claims 1 - 3 an unsaturated phosphate monomer of formula $\text{CH}_2=\text{C}(\text{X})-\text{CO}-(\text{OY})_n-\text{OPO}(\text{OH})_2$ wherein X may be hydrogen or methyl, Y is an alkylene group having 2 - 4 carbon atoms and n is an integer of 3 to 30. In particular, claim 3 mentions compounds wherein Y = propylene or ethylene and n=6 or 12. These compounds are preferably prepared by reacting a (meth)acrylic acid with an alkylene oxide to form a polyalkyleneglycol monoester (preferably in the presence of a catalyst) which is then reacted with orthophosphoric acid (page 3, lines 2 - 15). From the worked examples it is clear that these compounds are also commercially available (eg Phosmer PP, Phosmer 12PP from Uni Chemical Co.).

The unsaturated phosphate compounds mentioned above are used in D2 in aqueous coating compositions comprising in addition an acrylic resin and a pigment (see claim 1).

The subject matter of claims 1 - 31 of the present application is therefore not novel over the disclosure of D2 (Article 33(2) PCT).

In addition, it is known from D1 (page 2, lines 7 - 12, page 3, line 9 to page 4, lines 35) to use these unsaturated phosphate compounds as polymerisable emulsifiers in compositions especially suitable for coatings. Therefore, the subject matter of claims 1 - 31 does not appear to be based on an inventive step taking into account the teachings of D1 and D2 (Article 33(3) PCT).

ad section VIII.:

Claims 29 - 31 contain a reference to the description. According to Rule 6.2(a) PCT,

**WRITTEN OPINION
SEPARATE SHEET**

International application No. PCT/GB99/03574

claims should not contain such references except where absolutely necessary, which is not the case here.

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT

(PCT Rule 71.1)

To:

BARKER BRETTELL
138 Hagley Road
Edgbaston
BIRMINGHAM, B16 9PW
GRANDE BRETAGNE

Date of mailing
(day/month/year) 10.11.2000

Applicant's or agent's file reference
CDK1611

IMPORTANT NOTIFICATION

International application No.
PCT/GB99/03574

International filing date (day/month/year)
28/10/1999

Priority date (day/month/year)
06/11/1998

Applicant
ALBRIGHT & WILSON UK LIMITED et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

✓ *DD*
CDK

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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)


Applicant's or agent's file reference CDK1611	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB99/03574	International filing date (day/month/year) 28/10/1999	Priority date (day/month/year) 06/11/1998
International Patent Classification (IPC) or national classification and IPC C08F2/26		
Applicant ALBRIGHT & WILSON UK LIMITED et al.		

- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 5 sheets, including this cover sheet.
 - ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 15/05/2000	Date of completion of this report 10.11.2000
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Knutzen-Mies, K Telephone No. +49 89 2399 8525



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB99/03574

I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).)*:

Description, pages:

1-13 as originally filed

Claims, No.:

1-31 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB99/03574

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	
	No:	Claims	1-31
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-31
Industrial applicability (IA)	Yes:	Claims	1-31
	No:	Claims	

**2. Citations and explanations
see separate sheet**

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB99/03574

ad section V.:

The most relevant prior art cited in the international search report is considered to be represented by the following documents

D1 FR-A-2 325 662

D2 EP-A-458 245.

D2 discloses at page 3, lines 3 - 20 and in claims 1 - 3 an unsaturated phosphate monomer of formula $\text{CH}_2=\text{C}(\text{X})-\text{CO}-(\text{OY})_n-\text{OPO}(\text{OH})_2$ wherein X may be hydrogen or methyl, Y is an alkylene group having 2 - 4 carbon atoms and n is an integer of 3 to 30. In particular, claim 3 mentions compounds wherein Y = propylene or ethylene and n=6 or 12. These compounds are preferably prepared by reacting a (meth)acrylic acid with an alkylene oxide to form a polyalkyleneglycol monoester (preferably in the presence of a catalyst) which is then reacted with orthophosphoric acid (page 3, lines 2 - 15). From the worked examples it is clear that these compounds are also commercially available (eg Phosmer PP, Phosmer 12PP from Uni Chemical Co.).

The unsaturated phosphate compounds mentioned above are used in D2 in aqueous coating compositions comprising in addition an acrylic resin and a pigment (see claim 1).

The subject matter of claims 1 - 31 of the present application is therefore not novel over the disclosure of D2 (Article 33(2) PCT).

In addition, it is known from D1 (page 2, lines 7 - 12, page 3, line 9 to page 4, lines 35) to use these unsaturated phosphate compounds as polymerisable emulsifiers in compositions especially suitable for coatings. Therefore, the subject matter of claims 1 - 31 does not appear to be based on an inventive step taking into account the teachings of D1 and D2 (Article 33(3) PCT).

ad section VIII.:

Claims 29 - 31 contain a reference to the description. According to Rule 6.2(a) PCT,

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB99/03574

claims should not contain such references except where absolutely necessary, which is not the case here.

POLYMERISABLE SURFACTANTS

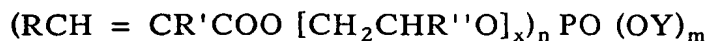
The present invention relates to polymerisable surfactants comprising at least one hydrophobic polymerisable group which is linked by polyalkyleneoxy groups to a hydrophilic group. The surfactants are particularly useful in emulsion-polymerised surface coatings. The present invention also relates to a method of making the polymerisable surfactants, to uses thereof, and to surface coatings including the surfactants.

10

Polymerisable surfactants are known in the art and have often been used in surface coatings. However, such prior-art surfactant-containing coatings have a tendency to absorb moisture resulting in partial detachment of the coating, a problem known as "bloom". The problem of "blush", a whitening effect of a coating when subjected to prolonged immersion in water, is also evident in coatings containing prior-art surfactants.

The object of the present invention is to provide a polymerisable surfactant which is particularly suitable for use in surface coatings, which has improved water resistance and which reduces the problems of "bloom" and "blush" in coatings. A method of making such a polymerisable surfactant is also provided.

According to a first aspect, the present invention provides a polymerisable surfactant having at least one hydrophobic polymerisable group which is linked by polyalkyleneoxy groups to a hydrophilic group, wherein the polymerisable surfactant is of the general formula:



where $n + m = 3$

x is between 5 and 40

R = H or CH_3 or $COOR'''$

5 R' = H or CH_3

R'' = H, CH_3 or C_2H_5

R''' = $C_1 - C_{20}$ alkyl

Y = H or an alkali metal atom

10 Preferably the hydrophobic polymerisable group represented by $RCH = CR'COO$ is acrylate or methacrylate, in which case R is hydrogen and R' is hydrogen or methyl respectively.

The hydrophobic polymerisable group may alternatively be maleate,
15 fumarate, crotonate or isocrotonate.

Preferably x is between 10 and 30, more preferably 17 and 22, most preferably x is 20.

20 Preferably the oxyalkylene groups represented by $[CH_2CHR''O]$ comprise mainly propyleneoxy groups. For example, from 80% - 100% of the oxyalkylene groups may be propyleneoxy groups. Preferably, at least 90%, more preferably at least 95% and most preferably at least 98% of the oxyalkylene groups are propyleneoxy groups.

25

The balance of the oxyalkylene groups not being propyleneoxy groups is preferably selected from ethyleneoxy or butyleneoxy groups.

The oxyalkylene groups as well as acting as linking groups, in fact form
30 the main hydrophobe in the polymerisable surfactant.

Preferably the hydrophilic group represented by $\text{PO}(\text{OY})_m$ is a phosphate group, i.e. Y represents hydrogen. Alternatively, the hydrophilic group may be a water-soluble phosphate salt group, for example alkali metal phosphate, in which Y represents an alkali metal atom.

5

Although it is not intended that the present invention be construed with reference to any particular theory, it is believed that surfactants according to the present invention exhibit improved water-resistance in comparison with prior-art surfactants because they do not include a non-ionic hydrophilic group, such as polyethylene oxide. In many prior-art polymerisable surfactants, a hydrophilic non-ionic group is present which can give rise to poor water sensitivity in a final coating. Ionic groups are only hydrophilic when ionised and therefore the resultant dried coatings are less hydrophilic and less water sensitive than coatings including non-ionic hydrophiles.

10
15

According to a second aspect, the present invention provides a method of making a polymerisable surfactant according to the first aspect of the present invention, the method comprising the steps of:

20

reacting an unsaturated carboxylic acid corresponding to the hydrophobic group with an alkylene oxide corresponding to the oxyalkylene linking group while maintaining the temperature of the reaction below that at which spontaneous polymerisation of the unsaturated groups of the hydrophobic group would occur; and

25

phosphating the resultant polyalkoxylated hydrophobic group.

The polyalkoxylation process step may be carried out with the aid of a catalyst. The catalyst is preferably a catalyst for alkoxylation which does

30

not catalyse the polymerisation of unsaturated groups of the hydrophobic group.

A preferred catalyst for alkoxylation is a strong Lewis acid such as boron trifluoride.

Preferably, a portion, most preferably a small portion, of the catalyst for alkoxylation is added to the unsaturated carboxylic acid before the alkylene oxide. Preferably the bulk of the catalyst is added with the alkylene oxide. A remaining portion of the catalyst is preferably added after completion of addition of the alkylene oxide to maximise conversion as the catalyst has a short active life. Hydroquinone is preferably added to the reaction mixture after the addition of the remaining portion of the catalyst. The hydroquinone is added to inhibit autopolymerisation of the unsaturated groups of the hydrophobic group. Any unreacted alkylene oxide may be removed, preferably by sparging with air.

Preferably, the reaction of the unsaturated carboxylic acid and the alkylene oxide is carried out in an inert atmosphere, for example under nitrogen. The reaction mixture may be stirred. Preferably, moisture is excluded from the reaction mixture. Preferably, the alkylene oxide is added continuously at a constant rate over a given time period, suitably 90 minutes.

The phosphorylation step is preferably carried out by means of phosphorus pentoxide. The most preferred form of phosphorus pentoxide is the solid form. The phosphorus pentoxide may be added over a given period of time, preferably one hour. Preferably, when addition of the phosphorus pentoxide is complete, the resulting mixture is maintained at an elevated temperature, such as 80°C, for about 4 hours, with stirring.

Preferably, the product of the phosphation step is treated to remove any free phosphoric acid. The presence of phosphoric acid can be detrimental to the final product containing the surfactant. Deionised water may be used to wash the product.

5

According to a third aspect, the present invention provides a coating including a polymerisable surfactant according to the first or second aspect of the invention.

10 Preferably the coating is an acrylic coating, an acrylic or vinyl halide latex composition, a latex paint, a coating for contact lenses, a coating to modify the surface properties of organic polymers, glass, graphite, metals, a coating to convert hydrophilic articles to hydrophobic articles and *vice versa*, a coating for fabrics.

15

Preferably the coating is an emulsion polymerised coating.

The present invention also provides adhesives, flocculants, resinous binders, polymer materials for medical or dental use and oil-displacing
20 fluids including the polymerisable surfactant of the present invention.

Examples of the polyalkoxylation and phosphation steps are set out below:

Polyalkoxylations

25 **Example 1**

Polypropoxylate(20) Methacrylate (PP20M)

Reagents:

30

6

Methacrylic Acid:	28.3g	(0.329 mol)
Propylene oxide:	381.6g	(6.580 mol)
Boron trifluoride etherate:	5.0 ml	
Hydroquinone, monomethyl ether:	0.20 g	

5

A reactor comprising a 1-litre jacketed vessel fitted with overhead stirrer, septum cap, nitrogen bleed, condenser, peristaltic addition tube and thermometer was heated to 120°C for 1 hour under nitrogen and the flask lid flamed to ensure dryness. The reactor was then cooled to room temperature.

10

Methacrylic acid (28.3g, 0.329 mol) and boron trifluoride etherate (1.0 ml) were charged to the reactor (BF₃ by syringe/septum seal). Propylene oxide was then added to the stirred reaction mixture at a constant rate over 90 minutes, using a peristaltic pump. Starting at the same time, the remainder of the BF₃ was added over 120 minutes via a screw-feed syringe pump. Immediately the additions commenced the temperature rose to 40°C and the reactor jacket was cooled to - 5°C. Care was taken to ensure that the reaction temperature was maintained between 40 and 50°C throughout the propylene oxide addition.

15

20

After the addition of the propylene oxide was complete, the jacket temperature was raised to 50°C while the BF₃ addition was completed. When this addition was complete the nitrogen bleed was replaced with an air bleed and monomethylether hydroquinone (0.20g, 500 ppm) added. The jacket temperature was raised to 60°C and the clear, colourless product was sparged with air to remove any unreacted propylene oxide.

25

Example 2**Polypropoxylate(6) Methacrylate (PP6M)**

- 5 The procedure of Example 1 was followed, but with the following reagents:

	Methacrylic Acid:	28.3g	(0.329 mol)
	Propylene oxide:	114.5g	(1.974 mol)
10	Boron trifluoride etherate:	3.0 ml	
	Hydroquinone, monomethyl ether	0.07g	

Example 3**15 Polypropoxylate(12) Methacrylate (PP12M)**

The procedure of Example 1 was followed, but with the following reagents:

20	Methacrylic Acid:	28.3g	(0.329 mol)
	Propylene oxide:	229.0g	(1.974 mol)
	Boron trifluoride etherate:	5.0 ml	
	Hydroquinone, monomethyl ether	0.13g	

25 Example 4**Polypropoxylate(28) Methacrylate (PP28M)**

- The procedure of Example 1 was followed, but with the following reagents:
- 30

8

Methacrylic Acid:	14.1g	(0.164 mol)
Propylene oxide:	266.3g	(4.592 mol)
Boron trifluoride etherate:	5.0 ml	
Hydroquinone, monomethyl ether	0.14g	

5

Example 5**Polybutoxylatepropoxylate(12) Methacrylate (PBP12M)**10 **Reagents:**

Methacrylic Acid:	28.3g	(0.329 mol)
Propylene oxide:	114.5g	(1.970 mol)
Butylene oxide:	142.0g	(1.970 mol)
15 Boron trifluoride etherate:	8.0 ml	
Hydroquinone, monomethyl ether	0.14g	

A reactor comprising a 1-litre jacketed vessel fitted with overhead stirrer, septum cap, nitrogen bleed, condenser, peristaltic addition tube and
20 thermometer was heated to 120°C for 1 hour under nitrogen and the flask lid flamed to ensure dryness. The reactor was then cooled to room temperature.

Methacrylic acid (28.3g, 0.329 mol) and boron trifluoride etherate (1.0
25 ml) were charged to the reactor (BF₃ by syringe/septum seal). Propylene oxide (114.5g) and butylene oxide (142.0g) were combined and added to the stirred reaction mixture at a constant rate over 90 minutes, using a peristaltic pump. Starting at the same time, the remainder of the BF₃ was added over 120 minutes, via a screw-feed syringe pump. Immediately the
30 additions commenced the temperature rose to 40°C and the reactor jacket

was cooled to -5°C . Care was taken to ensure that the reaction temperature was maintained between 40 and 50°C throughout propylene oxide and butylene oxide addition.

- 5 After the addition of propylene oxide/butylene oxide was complete, the jacket temperature was raised to 50°C while the BF_3 addition was completed. When this addition was complete the nitrogen bleed was replaced with an air bleed and monomethyl ether hydroquinone (0.14g , 500 ppm) added. The jacket temperature was raised to 60°C and the
- 10 clear, colourless product was sparged with air to remove any unreacted propylene oxide/butylene oxide.

Phosphation

Example 6

15

Polypropoxylate(20) Methacrylate Phosphate (PP20MP)

Reagents:

- 20 PP20M (Example 1): 260g (0.196 mol)
Phosphorus Pentoxide: 9.9g (0.081 mol)

- A 1 litre jacketed vessel fitted with overhead stirrer, air bleed, condenser, solid-addition inlet and thermometer was charged with PP20M (260g),
- 25 which was stirred vigorously whilst being heated to 60°C . Phosphorus pentoxide (9.9g) was added via the solid-addition inlet over 1 hour. The temperature was then raised to 80°C and the reaction mixture stirred at this temperature for a further 4 hours before being cooled. The yellow, oily product was then washed with distilled water until the pH of the
- 30 water washings rose to 3.0.

An example of the use of the polymerisable surfactant of Example 1 in an acrylic emulsion is set out below.

Example 7

5

Preparation of an Acrylic Latex Using PP20MP

Reagents:

10	Solution (1)	PP20MP (Example 1) :	5.6g
		Water:	290g
		Ammonia (37% aq)	0.5ml
	Solution (2)	Methyl Methacrylate:	201g
15		Butyl Acrylate:	162g
	Solution (3)	Methacrylic Acid:	4.6g
		Ammonium Persulphate:	1.2g
		Water:	58g
20		Ammonia (37%aq):	5.0ml
	Solution (4)	Ammonium Persulphate:	0.3g
		Water:	6g

- 25 A 2 litre resin pot fitted with nitrogen inlet, condenser, overhead stirrer and two peristaltic addition inlets was charged with solution (1). The milky solution was stirred at 350 rpm whilst being heated to 80°C under nitrogen. After 30 minutes 15g of solution (2), 3g of solution (3) and half of solution (4) was added. Almost immediately a blue tint was observed
- 30 indicating that polymerisation had commenced. After 5 minutes the

remainder of solutions (2) and (3) were added dropwise over 3.5 hours. Fifteen minutes after additions were completed the remainder of solution (4) was added and the emulsion left stirring for 1 hour at 80°C. The latex produced was cooled to room temperature and filtered through a 150 µm mesh.

Example 8

Preparation of a Comparative Latex Using an Industry Standard Surfactant - Empimin*OT60

The procedure of Example 7 (above) was repeated using 5.6g Empimin OT60 (a dialkyl sulfosuccinate made by Albright & Wilson Limited) in place of PP20MP.

*Epimin is a Registered Trade Mark

Example 9

Comparison Test

A comparison of two polymer latices made by the method of Example 7, but using amounts of 1.5% and 3.0% weight with respect to total monomer weight of polymerisable surfactant with the control polymer latex made by the method of Example 8 was, carried out.

The comparison used three tests set out below:

(a) Gloss on mild steel

Emulsions were drawn on a film of a cleaned dry mild steel panel using a 100 μ bar. The coated panels were placed in an oven at 50°C overnight.

The gloss was measured at 20°C and 60°C using a Rhopoint
5 "Novo-Gloss" glossmeter.

(b) Foaming

25ml of each emulsion was diluted with an equal volume of deionised
10 water and placed in a 100 ml measuring cylinder and shaken for 30
seconds. The foam height is presented as a percentage of the initial liquid
height.

(c) Adhesion

15

Adhesion was tested on panels of mild steel and aluminium by applying
emulsion to the panels as described in (a) and according to BS 39000:
E6 : 1992.

20 The results of the above 3 tests are set out in Table 1 (below).

TABLE 1

Polymer	Gloss		Foam Height	Adhesion (x hatch and Peel)	
	60°C	20°C		Aluminium	Mild steel
Control	80	46.5	130	Complete removal	75% of squares removed
1.5% PP20MP	93.8	79.5	30	No removal	No removal
3.0% PP20MP	97.2	92.6	26	No removal	No removal

5 Comparison of the Latices

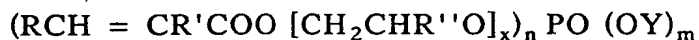
The polymer latex prepared in Example 7 having 1.5% and 3.0% polymer has been compared with that produced in Example 8. The coatings produced from dried films of the latices have also been compared.

10

The latex produced using PP20MP (Example 7) has higher gloss, reduced water- sensitivity and increased adhesion to aluminium and steel substrates than that prepared with Empimin OT60 (Example 8).

CLAIMS

1. A polymerisable surfactant having at least one hydrophobic polymerisable group which is linked by polyalkyleneoxy groups to a hydrophilic group, wherein the polymerisable surfactant is of the general formula:



where $n + m = 3$

- 10 x is between 5 and 40
 R = H or CH_3 or $COOR'''$
 R' = H or CH_3
 R'' = H, CH_3 or C_2H_5
 R''' = $C_1 - C_{20}$ alkyl
 15 Y = H or an alkali metal atom

2. A polymerisable surfactant according to Claim 1 wherein the hydrophobic polymerisable group represented by $RCH = CR'COO$ is acrylate.

20

3. A polymerisable surfactant according to Claim 1 wherein the hydrophobic polymerisable group represented by $RCH = CR'COO$ is methacrylate.

- 25 4. A polymerisable surfactant according to Claim 1 wherein the hydrophobic polymerisable group is maleate, fumarate, crotonate or isocrotonate.

5. A polymerisable surfactant according to any preceding claim
 30 wherein x is between 17 and 22.

6. A polymerisable surfactant according to Claim 5 wherein x is 20.
7. A polymerisable surfactant according to any preceding claim wherein the oxyalkylene groups represented by $[\text{CH}_2\text{CHR}'\text{O}]$ comprise
5 mainly propyleneoxy groups.
8. A polymerisable surfactant according to Claim 7 wherein from 80% - 100% of the oxyalkylene groups are propyleneoxy groups.
- 10 9. A polymerisable surfactant according to Claim 7 or 8 wherein the balance of the oxyalkylene groups not being propyleneoxy groups is selected from ethyleneoxy and butyleneoxy groups.
10. A polymerisable surfactant according to any preceding claim
15 wherein the hydrophilic group represented by $\text{PO}(\text{OY})_m$ is a phosphate group, where Y represents hydrogen.
11. A polymerisable surfactant according to any one of Claims 1-9 wherein the hydrophilic group represented by $\text{PO}(\text{OY})_m$ is a water-soluble
20 phosphate salt group.
12. A polymerisable surfactant according to Claim 11 wherein the water soluble phosphate salt is group is an alkali metal phosphate, in which Y represents an alkali metal atom.
- 25 13. A method of making a polymerisable surfactant according to any one of Claims 1 to 12, the method comprising the steps of:
- reacting an unsaturated carboxylic acid corresponding to the hydrophobic
30 group with an alkylene oxide corresponding to the oxyalkylene linking

group while maintaining the temperature of the reaction below that at which spontaneous polymerisation of the unsaturated groups of the hydrophobic group would occur; and

- 5 phosphating the resultant polyalkoxylated hydrophobic group.

14. A method according to Claim 13 wherein the polyalkoxylation process step is carried out with the aid of a catalyst.

- 10 15. A method according to Claim 14 wherein the catalyst is a catalyst for alkoxylation which does not catalyse the polymerisation of unsaturated groups of the hydrophobic group.

- 15 16. A method according to Claim 14 or 15 wherein the catalyst for alkoxylation is a strong Lewis acid.

17. A method according to Claim 16 wherein the Lewis acid is boron trifluoride.

- 20 18. A method according to any one of Claims 14 to 17 wherein a small portion of a catalyst for alkoxylation is added to the unsaturated carboxylic acid before addition of the alkylene oxide.

- 25 19. A method according to any one of Claims 14 to 18 wherein a bulk portion of the catalyst for alkoxylation is added to the unsaturated carboxylic acid with the alkylene oxide.

- 30 20. A method according to any one of Claims 14 to 19 wherein a small portion of the catalyst for alkoxylation is added after completion of the addition of the alkylene oxide.

21. A method according to Claim 20 wherein hydroquinone is added to the reaction mixture after the addition of the small portion of catalyst.
22. A method according to any one of Claims 13 to 21 wherein any
5 unreacted alkylene oxide is removed.
23. A method according to Claim 22 wherein the alkylene oxide is removed by sparging with air.
- 10 24. A method according to any one of Claims 13 to 23 wherein the reaction of the unsaturated carboxylic acid and the alkylene oxide is carried out in an inert atmosphere.
- 15 25. A method according to any one of Claims 13 to 24 wherein the phosphation step is carried out by reaction with phosphorus pentoxide.
- 20 26. A method according to any one of Claims 13 to 25 wherein the product of the phosphation step is treated to remove any unreacted phosphoric acid.
27. A coating including a polymerisable surfactant according to any one of Claims 1 to 12 or made by the method of any one of Claims 13 to 26.
- 25 28. A coating according to Claim 28, which is an emulsion polymerisable coating.
29. A polymerisable surfactant substantially as described herein.

30. A method of making a polymerisable surfactant substantially as described herein.

31. A coating including a polymerisable surfactant substantially as
5 described herein.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 99/03574

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C08F2/26 C09D157/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C08F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	US 3 855 364 A (R. STECKLER) 17 December 1974 (1974-12-17) -----	
A	EP 0 458 245 A (NIPPON PAINT CO.) 27 November 1991 (1991-11-27) -----	

☐ Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
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- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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